

WHAT IS CLAIMED IS:

1. A laser diode driving device, comprising:
  - a constant current source;
  - 5 a switch with one end connected to the constant current source; and
  - a laser diode drive current amplifier with an input terminal connected to the other end of the switch and an output terminal connected to a laser diode.
- 10 2. The laser diode driving device according to claim 1, wherein the laser diode drive current amplifier is composed of a mirror circuit of a PchMOS transistor.
3. A laser diode driving device, comprising:
  - 15 a constant current source;
  - a switch with one end connected to the constant current source;
  - a laser diode drive current amplifier with an input terminal connected to the other end of the switch and an output terminal connected to a laser diode;
  - 20 a first differentiation circuit that differentiates a control signal for controlling the switch; and
  - a first voltage-current conversion circuit that outputs a current having the same polarity as that of the constant current source, in which an input terminal is connected to an output terminal of the first differentiation
  - 25 circuit, and an output terminal is connected to an input terminal of the laser diode drive current amplifier.
4. The laser diode driving device according to claim 3, further comprising:
  - a second differentiation circuit that differentiates the control signal
  - 30 for controlling the switch; and
  - a second voltage-current conversion circuit that outputs a current having a polarity opposite to that of the constant current source, in which an input terminal is connected to an output terminal of the second
  - 35 differentiation circuit, and an output terminal is connected to an input terminal of the laser diode drive current amplifier.
5. The laser diode driving device according to claim 3, wherein the laser

diode driving current amplifier is composed of a mirror circuit of a PchMOS transistor.

5 6. The laser diode driving device according to claim 3, wherein the first differentiation circuit includes a capacitor at an output terminal.

7. The laser diode driving device according to claim 4, wherein the second differentiation circuit includes a capacitor at an output terminal.

10 8. The laser diode driving device according to claim 3, wherein the first voltage-current conversion circuit includes:

a first resistor with one end connected to an output terminal of the first differentiation circuit and the other end grounded;

15 a first diode with a cathode connected to an output terminal of the first differentiation circuit and an anode grounded; and

a first transistor with a base connected to the output terminal of the first differentiation circuit, an emitter grounded, and a collector connected to the input terminal of the laser diode drive current amplifier.

20 9. The laser diode driving device according to claim 4, wherein the second voltage-current conversion circuit includes:

a second resistor with one end connected to an output terminal of the second differentiation circuit;

25 a second diode with a cathode connected to an output terminal of the second differentiation circuit; and

30 a second transistor with a base connected to the output terminal of the second differentiation circuit, a collector connected to a power supply terminal, and an emitter connected to the input terminal of the laser diode drive current amplifier together with the other end of the second resistor and an anode of the second diode.